

ICC-ES Evaluation Report

ESR-2995

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DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES**Section: 06 50 00—Structural Plastics****Section: 06 63 00—Plastic Railings****REPORT HOLDER:****EASTERN WHOLESALE FENCE CO., INC.**274 MIDDLE ISLAND ROAD
MEDFORD, NEW YORK 11763
(631) 698-0975www.illusionsvinylrailing.com**EVALUATION SUBJECT:****ILLUSIONS® VINYL RAILING SYSTEM™****1.0 EVALUATION SCOPE****Compliance with the following codes:**

- 2009 *International Building Code*® (2009 IBC)
- 2009 *International Residential Code*® (2009 IRC)
- 2006 *International Building Code*® (2006 IBC)
- 2006 *International Residential Code*® (2006 IRC)

Properties evaluated:

- Structural
- Durability
- Surface-burning characteristics

2.0 USES

The Illusions® Vinyl Railing System™ described in this report is for exterior use as guards for balconies, porches, decks and stairs in buildings of Type V-B (IBC) construction and other types of construction in applications where untreated wood is permitted by IBC Section 1406.3 or in buildings constructed in accordance with the IRC.

3.0 DESCRIPTION**3.1 General:**

The Illusions® Vinyl Railing System™ is composed of polyvinyl chloride (PVC) which is extruded, in accordance with the approved quality control manual, into prefinished railing system components. The system components are available in white, beige or grey colors.

3.2 Guards:

The Illusions® Vinyl Railing System™ is composed of top rails with aluminum "H" shaped inserts, bottom rails, and either square- or colonial-shaped balusters. The inserts are 1.73 inches (43.9 mm) wide by 3.18 inches (80.8 mm)

deep, and have 0.07-inch-thick (1.78 mm) flanges and a 0.10-inch-thick (2.54 mm) web. The inserts are made of ASTM B 221, 6005 alloy and T5 aluminum. Four styles of Illusions™ railings are available: Traditional square balusters with rectangular top rails; Traditional square balusters with T-Rail top rails; Colonial Spindle balusters with rectangular top rails; and Colonial Spindle balusters with T-Rail top rails. The rectangular top rails and the bottom rails are 2 inches (51 mm) wide by 3.5 inches (89 mm) deep. The T-Rail top rails have a wider top, resulting in an overall size of 3.5 inches (89 mm) wide by 3.5 inches (89 mm) deep. The Illusions® Vinyl Railing System™ is recognized for guardrails having a maximum height of 42 inches (107 cm) as shown in Table 1. The railings provide for 3.42-inch-wide (86.9 mm) openings between the 1½-inch (38.1 mm) square sections of the thermoformed hollow PVC Colonial balusters and the co-extruded hollow PVC Traditional balusters. The bottom and top rails have a 0.12-inch (3.05 mm) wall thickness, and the Traditional and Colonial balusters have a 0.08-inch (2.03 mm) wall thickness. See Figure 2 for typical component cross sections.

The top and bottom rails are fastened to the supporting structure using 2.5-inch-tall-by-2.75-inch-wide (64 mm by 70 mm) nylon brackets. The brackets have four screw holes used to fasten the brackets to the supports, a resting flange at the bottom, and a fastening flange on each side with three slotted screw holes each. The brackets are designed for mounting deck railings and stair railings to fixed wall surfaces or to braced columns.

3.3 Durability:

When subjected to weathering, insect attack and other decaying elements, material used to manufacture the Illusions® Vinyl Railing System™ is equivalent to preservative-treated or naturally durable lumber when used in locations described in Section 2.0 of this report. The Illusions® Vinyl Railing System™ has been evaluated for a temperature range of -20°F to 125°F (-29°C to 52°C).

3.4 Surface-burning Characteristics:

When tested in accordance with ASTM E 84, the Illusions® Vinyl Railing System™ has a flame-spread index of no greater than 200.

4.0 DESIGN AND INSTALLATION**4.1 General:**

Installation of the Illusions® Vinyl Railing System™ must comply with this report and the manufacturer's published installation instructions. A copy of these instructions must be available on the jobsite at all times during installation. When the manufacturer's published installation instructions differ from this report, this report governs.

4.2 Design:

The Illusions® Vinyl Railing System™ is satisfactory to resist the loads specified in IBC Section 1607.7.1 and IRC Table R301.5, when installed at a maximum edge-of-structure-to-edge-of-structure spacing as prescribed in Table 1 of this report.

4.3 Installation:

The Illusions® Vinyl Railing System™ has been evaluated for installation between two fixed points, such as walls or columns. The top rails must be reinforced with aluminum "H" shaped inserts, which are provided with the rails. The rails must be installed using the mounting plates supplied by Eastern Wholesale Fence Co., Inc., mounted on the supports at the appropriate heights for the bottom and top rails, with four No.10 by 1¹/₂-inch-long (38.1 mm) pan-head, stainless steel screws per bracket supplied by the manufacturer. The rails must be secured to the mounting brackets with two No. 10 by 3/4-inch (19.1 mm) stainless steel, pan head, self-tapping screws, making sure the screws engage and penetrate through the aluminum "H" shaped inserts. At stairs, the rails are installed in the same manner, with the bottom rail installed 2 inches above the risers. The attachment method described above for brackets to supports is for fasteners embedded into a wood substrate having a specific gravity of 0.50 (minimum), to a minimum depth of 1³/₈ inches (34.9 mm). Additional attachment methods are outside the scope of this report and are required to be submitted to the code official for approval. See Figure 1 for typical railing system installation.

5.0 CONDITIONS OF USE

The Illusions® Vinyl Railing System™ described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 The Illusions® Vinyl Railing System™ described in this report is limited to exterior use as guards for balconies, porches, decks and stairs in buildings of Type V-B (IBC) construction and other types of construction in applications where untreated wood is permitted by IBC Section 1406.3, or in buildings constructed in accordance with the IRC.
- 5.2 Installation must comply with this report, the manufacturer's published installation instructions and the applicable code. Only those fasteners and fastener configurations described in this report have been evaluated for the installation of the Illusions® Vinyl Railing System™. When the manufacturer's published installation instructions differ from this report, this report governs.

5.3 The determination of compatibility of the fasteners, metal post mount components and other metal hardware with the supporting construction, including chemically treated wood, is subject to approval by the code official.

5.4 Adjustment factors outlined in the AF&PA National Design Standard and applicable codes must not apply to the allowable capacity and maximum spans for the Illusions® Vinyl Railing System™.

5.5 The Illusions® Vinyl Railing System™ must be fastened directly to supporting construction. Where required by the code official, engineering calculations and construction documents consistent with this report must be submitted for approval. The calculations must verify that the supporting construction complies with applicable building code requirements and is adequate to resist the loads imparted upon it by the products and systems discussed in this report. The documents must contain details of the attachment to the supporting structure consistent with the requirements of this report. The documents must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.6 The top rail of the Illusions® Vinyl Railing System™ must not be permitted to be used as a handrail for stairways or ramps.

5.7 Posts are outside the scope of this report.

5.8 The Illusions® Vinyl Railing System™ components are produced in Calverton, New York, under a quality control program with inspections by Architectural Testing, Inc. (AA-676).

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Deck Board Span Ratings and Guardrail Systems (Guards and Handrails) (AC174), dated July 2010.

7.0 IDENTIFICATION

The Illusions® Vinyl Railing System™ components described in this report are identified on each individual piece or on the packaging. The identification includes a production code, the product type, the allowable span, the manufacturer's name (Eastern Wholesale Fence Co., Inc.) and/or trademark (see Figure 3), the inspection agency name and/or logo (see Figure 4), and the ICC-ES evaluation report number (ESR-2995).

TABLE 1—MAXIMUM GUARDRAIL SYSTEM SPANS¹

GUARDRAIL SYSTEM	GUARDRAIL TYPE	APPLICABLE BUILDING CODE ²		MAXIMUM SPAN ^{3,4} (inches)
		IBC	IRC	
Colonial balusters with maximum 42-inch-high Rectangular or T-Rail top rail	Level	Yes	Yes	92
	Stair	Yes	Yes	87.5
Traditional balusters with maximum 42-inch-high Rectangular or T-Rail top rail	Level	Yes	Yes	92
	Stair	Yes	Yes	87.5

For SI: 1 inch = 25.4 mm; 1 ft = 305 mm.

¹The ability of the supporting construction to resist the reaction from guardrail loads must be justified to the satisfaction of the code official.

²Indicates compliance with the respective building codes.

³Maximum allowable span has been adjusted for durability. No further increases are permitted.

⁴Maximum span is measured from edge-of-support-to-edge-of-support.

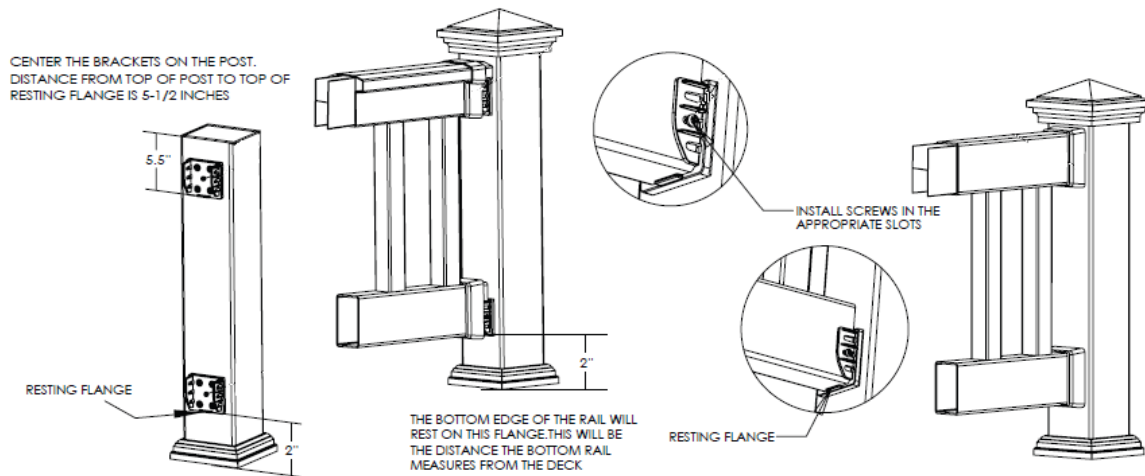


FIGURE 1—TYPICAL GUARDRAIL SYSTEM INSTALLATION

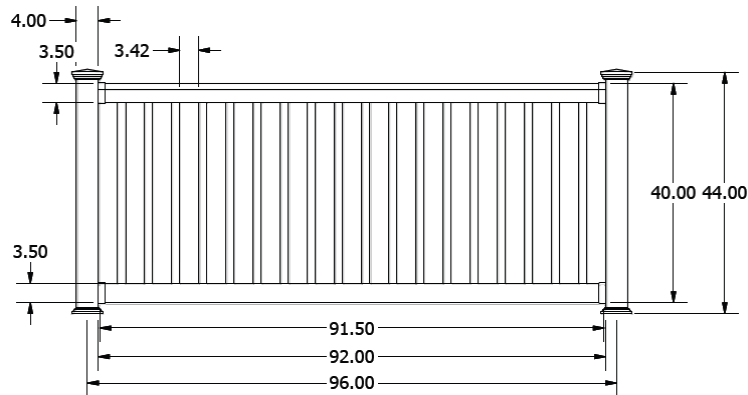
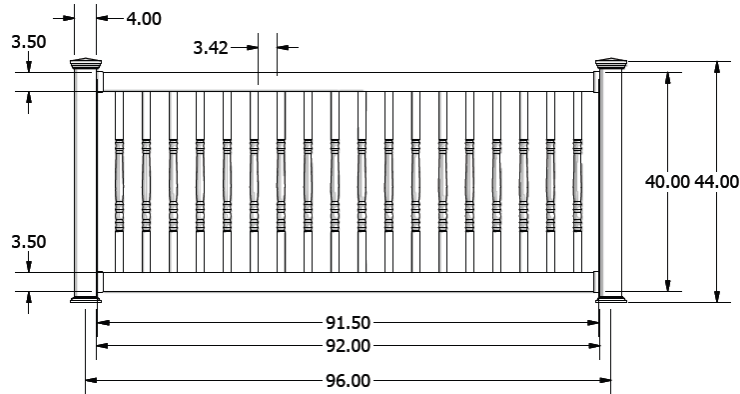
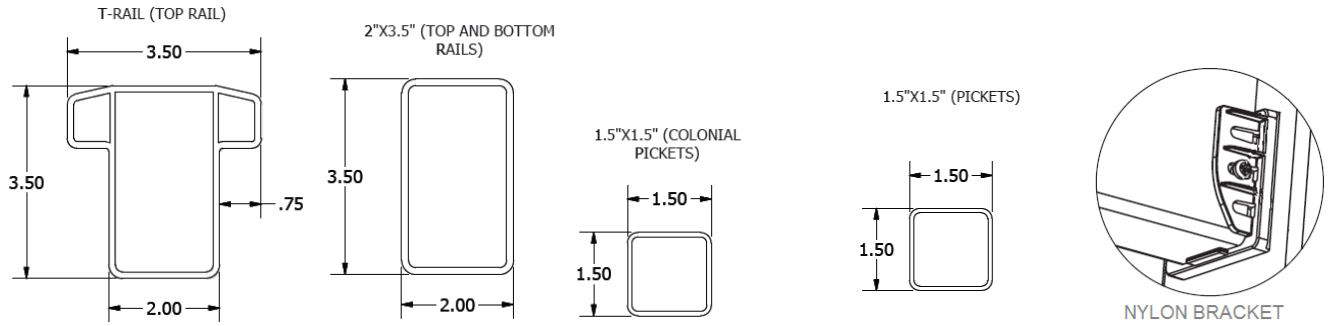


FIGURE 2—TYPICAL GUARDRAIL SYSTEM COMPONENT PROFILES



FIGURE 3—PRODUCT TRADEMARK



FIGURE 4—INSPECTION AGENCY LOGO